

BREASTS OF INAPPROPRIATE SIZE

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THIS article is especially concerned with breasts of unacceptable size to their owners or would-be admirers. Such breasts often present a formidable therapeutic challenge. The inappropriate degree of breast development may result from inadequate or excessive hormone stimulation, either endogenous or exogenous (iatrogenic); or it may be due to abnormal sensitivity or resistance to normal blood levels of female sex hormones; or it may simply be due to too much fat—or indeed to too little, as in anorexia nervosa—or to fluid retention.

FAILURE OF DEVELOPMENT DUE TO LACK OF OESTROGEN

Pituitary infantilism.—This condition is extremely rare in females and its most characteristic feature is the perfectly symmetrical but strikingly minute stature. As the result of the failure of gonadotrophin production there is no breast development.

Selective gonadotrophin failure.—This is a condition in which the pituitary deficiency is confined to the gonadotrophic-ovarian axis. The urinary gonadotrophin levels are diminished or undetectable. There is lack of breast development and the nipples and areolae are infantile in size and appearance. The labia minora cannot be delineated and the vagina and uterus are prepubertal in size. There is, however, normal growth of pubic hair.

GONADAL DYSGENESIS

Turner's syndrome.—The classical triad consists of lack of secondary sex characters including breast development, short stature—the patients seldom attain a height of more than 5 feet (150 cm.)—and the presence of congenital anomalies, of which webbing of the neck was described by Turner.

'Pure' gonadal dysgenesis.—The adjective 'pure' refers to the fact that the only manifestation of the triad is lack of secondary sex characters; this, however, may not be complete so that small breasts rather than no breasts may be found. Amenorrhoea, usually primary, is the rule. The women are normal in height and may be tall due to delayed closure of the epiphyses of the long bones, and they show no congenital anomalies.

Female pseudohermaphroditism due to congenital adrenal hypoplasia.—Owing to a defect of the 21-hydroxylase enzyme system the biosynthesis of cortisol is not completed in the foetal adrenal cortex. The lack of the cortisol which normally controls the output of corticotrophin releases excessive amounts of this hormone which stimulate the adrenal to produce high concentrations of androgens, and these lead to severe virilism, with complete lack of female breast development becoming evident if the disorder is not treated before puberty.

In these conditions the deficiency is congenital and the patient is born with the inability, without appropriate treatment, to produce sufficient female sex hormone after puberty to enable the breast tissue to develop.

ACQUIRED OVARIAN DEFICIENCY

Simmonds' disease is a condition of total failure of anterior pituitary function. In the great majority of cases it is due to postpartum necrosis of the gland (Sheehan's syndrome) resulting from prolonged lack of the blood supply to the pituitary as the result of profound postpartum haemorrhage. The woman is unable to breast feed her child and sometimes marked atrophy of the breasts ensues.

Ablation of the pituitary by surgical or other means may give rise to breast atrophy as part of the loss of secondary sex characters, though this in fact seldom occurs.

Pituitary tumours, especially those occurring during adolescence or early adult life such as craniopharyngiomas, may lead to such severe ovarian deficiency that the secondary sex characters are seriously affected and breast atrophy occurs.

Bilateral ovariectomy, if it has to be carried out in childhood, will lead to failure of breast development. If it is performed in adult life once the breasts have already fully developed they do not atrophy or else the diminution in size is so slight as to cause little cosmetic concern.

VIRILIZING OVARIAN OR ADRENAL TUMOURS

Virilizing ovarian tumours such as arrhenoblastomas are excessively rare and many experienced gynaecologists may never encounter one. They usually cause the most extreme degree of virilism including breast atrophy but the victim is usually so embarrassed by the hirsutism and deepening of the voice that the shrinking of the breasts is seldom noticed.

MANAGEMENT

All these conditions are primarily endocrine in origin and should therefore be expected to respond to endocrine therapy. In the case of congenital adrenal hyperplasia the obvious medication is to give cortisol, the hormone that is failing to be synthesized. The effects are dramatic. Corticosteroid therapy not only protects the patient from the risk of adrenocortical failure, it also adjusts pituitary control by inhibiting the excessive production of corticotrophin which has prevented the adequate release of gonadotrophins. With the restoration of normal gonadotrophic activity the ovarian cycle is initiated and, after puberty, oestrogen and progesterone will be secreted normally. Furthermore, the curb on the excessive activity of corticotrophin will prevent the adrenal gland from producing virilizing amounts of androgen. The patient is therefore normally feminized and breast development is one of the welcome results.

In the case of primary pituitary deficiency it is logical to suppose that gonadotrophin administration would be the physiological form of treatment,

but the present preparations of gonadotrophin are not sufficiently specific or sophisticated to induce breast development. One is therefore left with replacement therapy in the form of female sex hormone preparations.

My own therapeutic regimen is to give fairly large doses of oestrogen, for instance 5 mg. of stilboestrol or 0.15 mg. of ethinyloestradiol or 5 mg. of 'premarin' daily for twenty-one days starting on the first day of the menstrual cycle, if there is one. Because progesterone plays an important part in the development of the mammary gland tissue, as opposed to the duct tissue which is stimulated by oestrogen, I add progestogen to this in the form of norethisterone, 15 mg. daily for the same period of time. In addition I prescribe stilboestrol ointment made up in 1-gramme tubes containing 25 mg. of the hormone. The content of each tube should be thoroughly inuncted into the breasts each day for sixty days.

I say 'thoroughly' because one of my patients who consulted me because her husband was dissatisfied with her 'miserable little breasts' did not thoroughly inunct the ointment and her husband subsequently complained of gynaecomastia.

In cases in which the hypoplasia or absence of breast tissue is due to actual deficiency of circulating female sex hormone, this therapeutic regimen gives rise to some degree of breast development, though in many cases it is not as satisfactory as one would wish. In this connexion it is interesting that male-to-female transsexuals who are treated with enormous doses of oestrogen often attain only very modest breast development. On the other hand, some of the male workers employed by pharmaceutical firms to package oestrogen preparations develop embarrassing degrees of gynaecomastia, as indeed did the irate husband of my patient. It all depends on the degree of sensitivity or resistance of the breast tissue; this involves the second etiological factor: target organ response of breast tissue to the normal level of female sex hormones.

SMALL BREASTS

One of the best examples of target organ resistance is *unilateral hypoplasia* which no amount of sex hormone therapy will remedy. Even implantation of pellets of oestradiol into the breast tissue was ineffective in one patient. It would seem reasonable in these cases to resort to plastic surgery.

An example of differential target organ resistance is hypoplasia of mammary gland tissue with prominent nipple and areolar development. Some unfortunate girls, however, suffer from marked hypoplasia or almost complete aplasia of both mammary gland and duct system, with insignificant nipples and depigmented areolae, but in the majority of patients complaining of small breasts these are merely smaller than the patient would like them to be, though one would judge them to be within the normal range. The patients may say that the breasts have shrunk; particularly is this the case after a pregnancy.

MEDICAL TREATMENT

It is my practice therefore to give all patients with small breasts a limited trial of oestrogen/progestogen treatment in the form of three courses accompanied by sixty days' inunction of stilboestrol ointment. Stilboestrol

administered orally nearly always produces a layer of black pigmentation on the nipples and areolae which eventually scales off some time after the treatment has been discontinued. This never happens with other oestrogens or with stilboestrol ointment—perhaps because it is not effectively absorbed. It is for this reason that I use oral ethinyloestradiol, though in this rather high dose it sometimes causes transient nausea.

SURGICAL TREATMENT

With regard to augmentation, this is a much more difficult decision to make as to whether the surgery involved is worth while. Certainly many of these patients who are unmarried suffer from psychological feelings of inferiority amounting almost to an obsession, which seems even to interfere with their normal social life. In the case of married women the reason is usually an undue regression of breast tissue following pregnancy, leading to marital unhappiness, so it is alleged. Each case therefore has to be judged on its own merits and psychological factors are always involved.

With regard to treatment, most plastic surgeons dislike using foreign so-called inert materials when it is possible to make use of the patient's own living tissue. For this reason they prefer to use large dermo-fat grafts from the gluteal region, which normally do not show more than 15 per cent. shrinkage later over a period of years, a procedure which has been singularly free of complications. The operation, however, is long and painstaking, occupying $2\frac{1}{2}$ hours, and the patient is left with two 20-cm. oblique scars on the buttocks and two 7.5-cm. scars on the inframammary lines. With care in closure the buttock scars should not be depressed but do of course remain as permanent marks with slight flattening of the contour. The long-term fate of these grafts is not yet known, but occasional cases have been seen at ten or twelve years in which there has been some shrinkage with calcified patches in the grafts visible radiologically, presumably due to calcification in saponified zones of fat, and occasionally it has been found necessary to remove one graft for this reason. It may well be that in the future others will show a similar tendency, but by this time the acute problems which beset the patient earlier have usually resolved themselves. Certainly the procedure seems to work very well in detaching these patients from their obsessional mode of thought.

There are patients who are unable to accept a procedure involving scarring elsewhere, and for these if they are to be treated at all there is no alternative but the insertion of prostheses. Silicone injections into the soft tissues are to be condemned. A number of different prostheses have been designed; the early ones, which were sponge, became densely hard as they became integrated with scar tissue.

The Cronin type of prosthesis, which is a siliconized bag pre-filled with thick silicone solution, is popular in the United States of America and to some extent in the United Kingdom. It is marketed in three sizes; this is a drawback as the two larger are really rather large, and if there is any over-

distension the prosthesis tends slowly to push its way through the thin overlying cap of the residual breast tissue, and thus slowly herniates its way through to the subcutaneous position, giving a rather curious lumpy appearance. The complication rate with this type of prosthesis is fairly high, usually taking the form of sinus formation and subsequent infection, following which the prosthesis has to be removed or it will emerge spontaneously.

If a prosthesis is to be used at all, the French type, marketed as 'Simaplast', is often preferred. This consists of a small membranous bag externally siliconized, which can be inserted folded up through a 25-mm. incision into the retromammary position, and then distended as much as may be necessary by filling with 6 per cent. dextran in saline. The complication rate with this method seems to be small and most of the problems which have occurred appear to be due to mechanical leakage of dextran from the bag. As the scarring is minimal, if for some reason the prosthesis has to be removed the resultant disfigurement from the surgery is slight.

Plastic surgeons differ in opinion as to whether these prostheses have a place in treatment, and there appears to be no information about long-term results. On the other hand, the patients are usually very pleased with the result. The fat-grafting operation involves twelve days in hospital; for the insertion of prostheses, only four days are required.

LARGE BREASTS IN INFANCY AND CHILDHOOD

Neonatal hyperplasia.—This may occur in either sex and is due to a hangover of placental oestrogen influence on the foetus at term. It is therefore transient.

Premature thelarche.—This is a condition of extreme sensitivity of the breast tissue to the minute amount of oestrogen being manufactured before puberty. Sometimes the breast development occurs as early as 1 to 3 years of age and it may be unilateral. Usually the breasts are small but sometimes they grow embarrassingly large. The condition is often transient but may persist until the normal age of puberty. The nipples and areolae are usually underdeveloped and unpigmented and there is minimal oestrogenization of the vaginal smear and lack of development of the labia minora. In fact the increased sensitivity to oestrogen is confined to the mammary glands.

Precocious puberty.—In girls this is idiopathic in at least 90 per cent. of cases and of neurogenic origin in only a small number. The breast development conforms to the other signs of pubertal development. Occasionally this occurs at a very early age and indeed even at birth with menstruation starting at 6 weeks of age. There are some reports that progestogens such as medroxyprogesterone acetate suppress the prematurely released gonadotrophins and arrest the pubertal development.

Sexual precocity.—Very rarely a granulosa-cell tumour may produce menorrhagia and some breast development at an inappropriately early age.

LARGE BREASTS IN ADOLESCENT AND ADULT WOMEN

Virginal hypertrophy.—This is a distressing condition in which the child

when she reaches puberty rapidly develops grotesquely enormous breasts due to hyperplasia of the periductal fibrous stroma. So large, so shocking and embarrassing is the condition that one is inclined to take drastic steps, but these may be imprudent. Partial mastectomy may not halt the progressive hyperplasia and one hesitates to consider total removal of the breast tissue and insertion of a prosthesis, though there may be considerable pressure from the parents and even from the patient herself.

Postpartum ptosis.—In some women following pregnancy the breasts become flabby and sag down on the surface of the chest.

Pendulous breasts of obesity.—In extreme cases of obesity the only effective treatment may be surgical. Discomfort is caused by the abdominal wall hanging like an apron down to the thighs and the pendulous breasts almost down to the level of the umbilicus. Considerable relief may be obtained by performing an 'apronectomy' and by skilful breast reduction.

Fibroadenosis.—Many women complain of pain and swelling of the breasts in the week or two before menstruation, and on examination a generalized nodularity of the breast tissue can be felt. Some of the nodules are quite large and appear to be discrete and there may be a temptation to excise them surgically. If this is done other nodules develop and the woman may be condemned to a succession of operations. Fibroadenosis is due to an imbalance between the amount of effective oestrogen and progestogen in the second half of the menstrual cycle so that the mammary glands are more or less continuously under the influence of oestrogen. The condition is often accompanied by a tendency to premenstrual fluid-retention and can often be relieved by giving diuretics in the premenstrual fortnight accompanied by an oral progestogen such as norethisterone, 15 mg. daily from day 15 to day 25 of the menstrual cycle. If the progestogen therapy is continued up to the expected date of the next period this may be delayed.

SURGICAL BREAST REDUCTION

For the younger woman an operation has to be designed which will interfere with function to a minimum degree with regard to both possible future breast feeding and sensory function. Of the various operations designed, all are dependent on transposing the nipple and areola to a different position on a breast pedicle which may be either single (Biesenburt type of operation) or double (Strombeck type of procedure). The double-pedicled principle is safer in avoiding complications of fat necrosis, or even nipple necrosis from insufficient vascularization. On the other hand, the single-pedicled operation gives better freedom for the movement and adjustment of the residual breast tissue. In either instance, particularly if the reduction required is extensive, the best cosmetic result is often obtained by carrying out the surgery in two stages, the first being the major reduction, and the second a minor trim of scars and shape some three or six months later.

I am grateful to Mr. John Watson, F.R.C.S., Plastic Surgeon to the London Hospital and Queen Victoria Hospital, East Grinstead, who has written the sections dealing with the surgical management of breasts of inappropriate size.

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